



US005504919A

United States Patent [19]

Lee et al.

[11] **Patent Number:** **5,504,919**[45] **Date of Patent:** **Apr. 2, 1996**[54] **SORTER STRUCTURE BASED ON
SHIFTABLE CONTENT MEMORY**[75] **Inventors:** Chen-Yi Lee; Jer-Min Tsai; Po-Wen
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Taiwan[21] **Appl. No.:** 498,108[22] **Filed:** Jul. 5, 1995**Related U.S. Application Data**

[63] Continuation of Ser. No. 30,637, Mar. 12, 1993, abandoned.

[30] **Foreign Application Priority Data**

Feb. 19, 1993 [TW] Taiwan 82101162

[51] **Int. Cl.⁶** G06F 7/08[52] **U.S. Cl.** 395/800; 395/821; 395/840;
364/DIG. 1[58] **Field of Search** 395/800, 840,
395/821; 364/362.1, 362.3, DIG. 1[56] **References Cited****U.S. PATENT DOCUMENTS**

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An optimized high-speed sorter has a plurality of process elements connected in series. Each process element includes a sorting unit used to store a sorted item, and a comparing/controlling unit coupled to the sorting unit. In this sorter, all sorted items are compared with the input item simultaneously, and then are divided into an LE-group wherein the sorted items are less than or equal to the input item, and a G-group wherein the sorted items are greater than the input item. We assume that the sorted items are arranged in a descending sequence from left to right. In the insertion operation, the sorted items in the LE-group are shifted rightwards simultaneously, and the input item is loaded in the position between the LE-group and G-group. In the deletion operation, only the sorted items in the LE-group are shifted leftwards simultaneously. In order to accelerate the operation speed, the sorter adopts a pre-shift strategy.

14 Claims, 10 Drawing Sheets